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Electric Motors Standard**

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<b>Compiled by</b>	<b>Approved by</b>	<b>Authorised by</b>
		
<b>MJ Manyage</b>	<b>L Malaza</b>	<b>P Madiba</b>
<b>Chief Electrical Engineer</b>	<b>Electrical Plant Engineering Manager</b>	<b>EC&amp;I Senior Engineering Manager</b>
Date: <u>22-01-2013</u>	Date: <u>22/01/2013</u>	Date: <u>22/01/2013</u>

**Supported by TDAC**



**D. Odendaal**  
**TDAC Chairperson**

Date: 4/3/2013

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## 1. INTRODUCTION

This document contains information regarding the Transport of Power Stations Electric Motors (Rev 0).

## 2. SUPPORTING CLAUSES

### 2.1 SCOPE

#### 2.1.1 Purpose

This standard specifies the minimum Eskom's requirements for pre-shipping preparation and transportation of all Power Station electrical motors. The correct preparation, transporting and off-loading of motors that are returned after repairs is important to ensure that motors are not damaged during transportation. If these motors are prepared and handled incorrectly, damage that compromises the serviceability of the motor can occur during transportation.

#### 2.1.2 Applicability

The requirements of this standard are applicable to all Eskom Generation motors.

#### 2.1.3 Exclusions

This standard excludes the storage requirements for boiler water circulation pump.

### 2.2 NORMATIVE/INFORMATIVE REFERENCES

#### 2.2.1 Normative

None

#### 2.2.2 Informative

None

### 2.3 DEFINITIONS

None

#### 2.3.1 Classification

**Controlled Disclosure:** Controlled Disclosure to External Parties (either enforced by law, or discretionary).

### 2.4 ABBREVIATIONS

None

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## 2.5 ROLES AND RESPONSIBILITIES

None

## 2.6 PROCESS FOR MONITORING

None

## 2.7 RELATED/SUPPORTING DOCUMENTS

None

## 3. TRANSPORT OF POWER STATION ELECTRIC MOTORS

### 3.1 PREPARATION FOR TRANSPORT

Prior to motor loading onto shipping transport, the following requirements shall be met:

- a. All shaft extensions, exposed key-ways, half couplings, jacking screws and any other unpainted surfaces must be protected with anti-rust preparation such as Vargol bright part red.
- b. The oil in the housings of the white metal bearings must be drained. The power station shall specify of the following two options for the preparation of sleeve bearings
  - The bearing shells shall be replaced with wooden dummy bearings, dried and put into sealed storage boxes that shall be marked, with the motor Serial Number & Bearing Identification, and fixed onto the motor.
  - The bearing shells shall remain fitted.
- c. Where lubricant is fed from an external source, the inlet and the outlet flanges must be sealed to prevent ingress of contaminants.
- d. Bearing lubrication openings, terminal boxes which do not have covers, and openings without terminal boxes or gland plates shall be suitably sealed off with a plastic covering.
- e. The thermocouple/PT100 entries must be sealed off to prevent ingress of contaminants.
- f. A suitable shaft-locking device must be used to block the shaft from axial and radial movement during transportation.
- g. Water heat exchanges, having had tubes drained and dried-out, shall have all inlets and outlets sealed.
- h. Unless otherwise stated, motors with enclosure less than IP44 shall be enclosed in a wire mesh so that vermin may not enter.

### 3.2 MOTOR TRANSPORTATION

The following requirements shall be met for motor shipment:

- a. Motors shall be placed and secured on suitable packers e.g. wooden slats, rubber matting (conveyor belting), to prevent steel on steel contact and to absorb shock.
- b. Vertical motors must be transported in the vertical position and must be mounted onto suitable wooden transport stands or the OEM transport cradle.

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- c. The motors must be secured using the proper lifting points to prevent movement or chafing. Under no circumstances may securing ropes, belts or chains chafe against the units. If securing equipment does push up against the unit, suitable padding shall be inserted at this point to prevent damage to the unit or its paint work.
- d. Motors, which are shipped without a cooler, must have the exposed top securely covered with a hard plastic sheeting or cardboard. Openings for lifting lugs must be made on the cover. The motors must be covered with tarpaulin when in transit.
- e. Regardless of weather conditions, drip proof motors or open ventilated motors must be covered with plastic or cardboard and then a tarpaulin to prevent the ingress of dust or water during transportation. When a tarpaulin is used, the motor must first be covered with plastic sheeting or cardboard to prevent it from dirtying or marking the paintwork.

### **3.3 TRANSPORT OF LOOSE COMPONENTS**

#### **3.3.1 Shafts, rotors and armatures**

- a. When a shaft, rotor, or armature is to be shipped independently, the shaft extensions, bearing journals and any other important or ground journals must be painted with an anti-rust preparation such as Vargol bright red or an equivalent.
- b. Prior to transport, such journals must be protected by securely wrapping them in rubber or gasket sheeting.
- c. During transport, a shaft, rotor or armature must be placed on a suitable pallet, cradle or stand which must prevent any movement, rolling, chafing or banging of parts against each other. They must then be covered with a suitable tarpaulin.
- d. During transport of shaft, rotor or armature on a suitable pallet, cradle or stand, ensure that it is strapped at the position where the shaft is supported to prevent bowing.

#### **3.3.2 Stator Cores**

- a. During transport, wound or unwound stator cores must rest on the back of the core on a suitable pallet, cradle or stand that must prevent damage being done to the laminations or machined surfaces. They must be secured to prevent movement, rolling, chafing or banging against each other. Under no circumstances are the overhangs of wound stator cores to be damaged in any way. The wound stator cores must be placed or secured in such a way as to prevent contact between the windings and any other object or part of the vehicle.
- b. Stator cores must be covered with clean plastic or cardboard and then a tarpaulin to prevent ingress of dust or water during transportation under all circumstances.

#### **3.3.3 Stator frames and frame carcasses**

- a. During transport, stator frames and frame carcasses must be placed on suitable packers e.g. wooden slats or rubber matting, to prevent steel on steel contact and to prevent shock.
- b. Stator frames and frame carcasses must be secured by the proper lifting points to prevent movement or chafing.

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- c. Under no circumstances may securing ropes, belts or chains be allowed to chafe the stator frame and frame carcasses.
- d. If securing equipment does push up against the stator frame and frame carcase, suitable padding must be inserted at this point to prevent damage to the stator frames and frame carcasses or its paintwork.

### 3.3.4 Other loose components

- a. Bearing housings must be suitably sealed with a plastic sheet to prevent ingress of dirt or moisture.
- b. Bearings must be wrapped in their original plastic and boxes and must be packed flat to prevent false brinelling damage to the bearing.
- c. If many small loose components are to be transported, they must be individually and suitably wrapped in a packing material and then packed into a suitable crate or box.

## 4. RECORDS

None

## 5. AUTHORISATION

This document has been seen and accepted by:

Name	Designation
	This Document has been approved by TDAC ROD 13 February 2013

## 6. REVISIONS

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November 2012	0.1		36-397
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## 7. DEVELOPMENT TEAM

The following people were involved in the development of this document:

Name	Business Unit
Gert Brink	Arnot Power Station
Marubini Manyage	Group Technology Engineering
Phumlani Khumalo	Matla Power Station
Trevor Cusdin	Group Technology Engineering

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Victor Mdlalose	Kendal Power Station
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## 8. ACKNOWLEDGEMENTS

None

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